

# Proposal for Convection Absorber Test with Hydrogen at Fermilab

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February 21, 2003

# **Proposal for Testing of KEK Convection Absorber**

## **Charge:**

- Establish a cryogenic facility to allow performance analysis for a hydrogen absorber
- Establish a helium distribution system be used for hydrogen gas liquefaction - 6.2 liq liters of hydrogen
- Provide for safe test area which is based on Fermi Guideline for LH2 Targets

## **Proposal**

- Use Meson Cryogenic Helium system as refrigerant @ 17K
- Build an outdoor area to house KEK test cryostat which provides weather proofing and protection to personal as protection from animals
- Provide barrier to protect people and capital equipment in the case of an emergency

## Safety Issues to Address

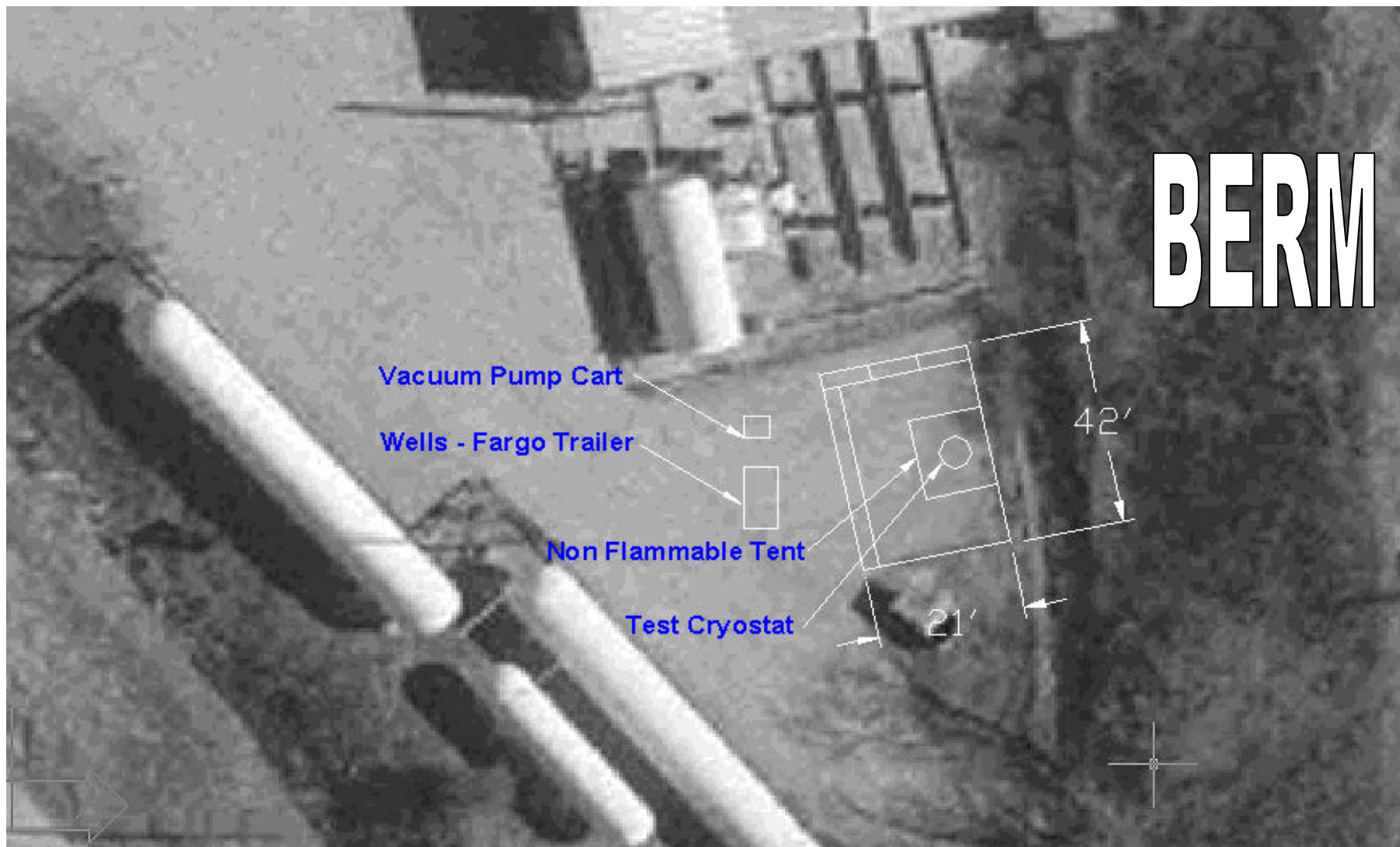
- KEK cryostat must meet FERMILAB ES&H standards and will be required to endure a Safety review
  - Engineering note for vessel, reliefs, and vacuum info
- System must be reviewed by Cryogenic panel-- What if, FMEA
- System must adhere to Guidelines for LH2 Target designs

Includes:

Electrical standards and Intrinsic safety

Proposing Mobile trailers outside of safe area for electrical distribution, DAQ, vacuum pumping.

Use of Safety Controls --- we have Quadlog PLC and will house inside of Meson Cryo Building



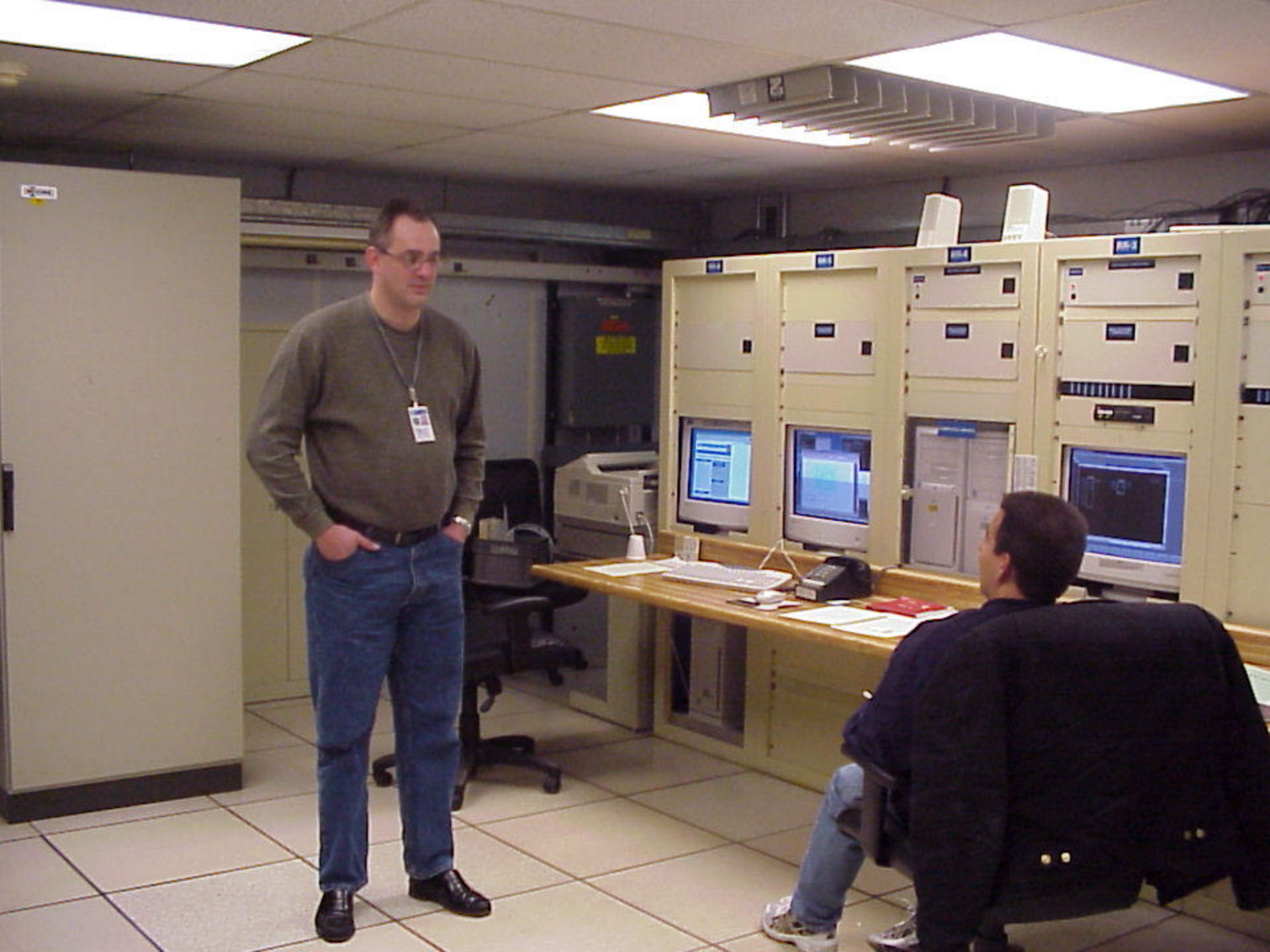
**Arial View of Meson Area with Proposed Setup**

















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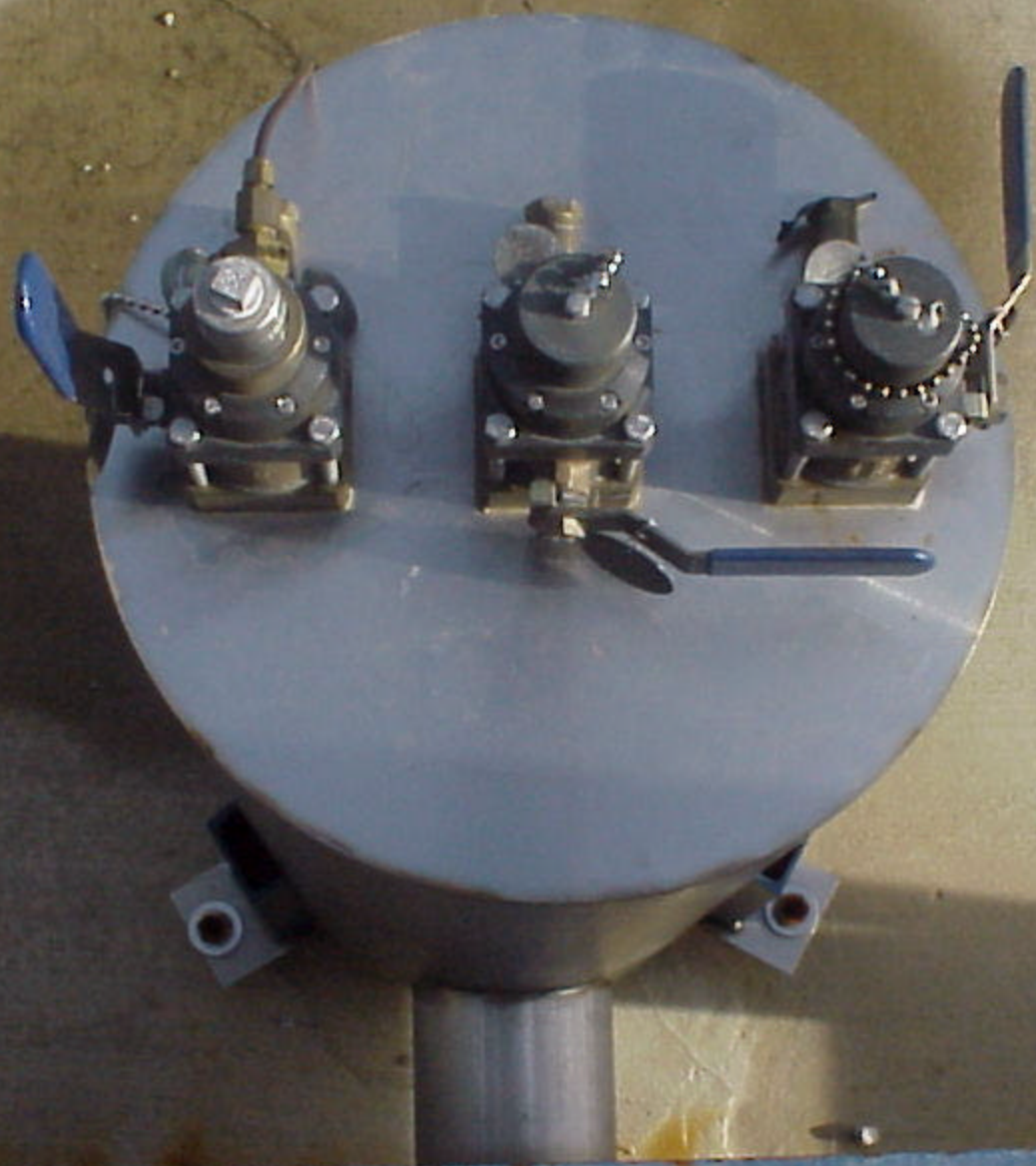




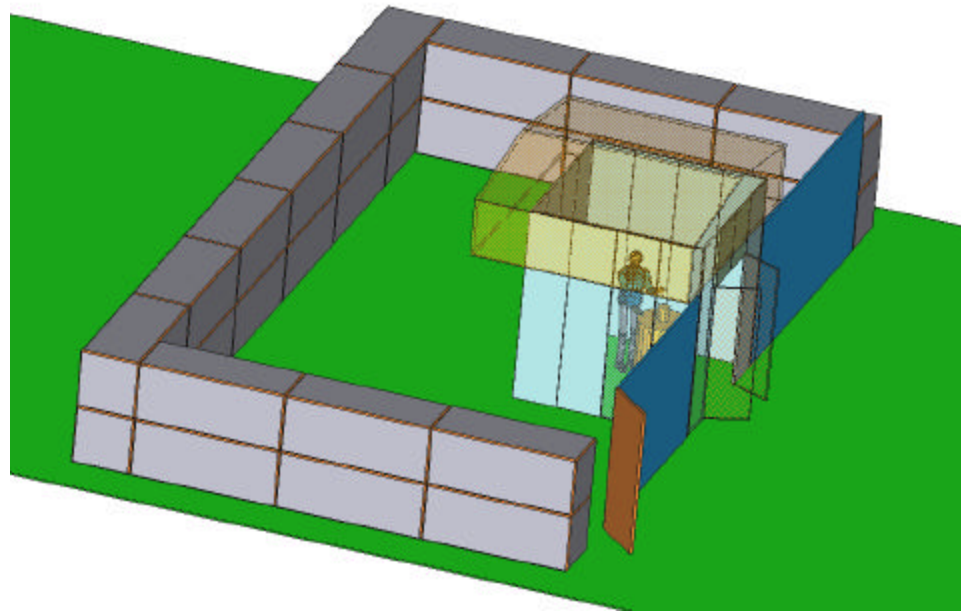








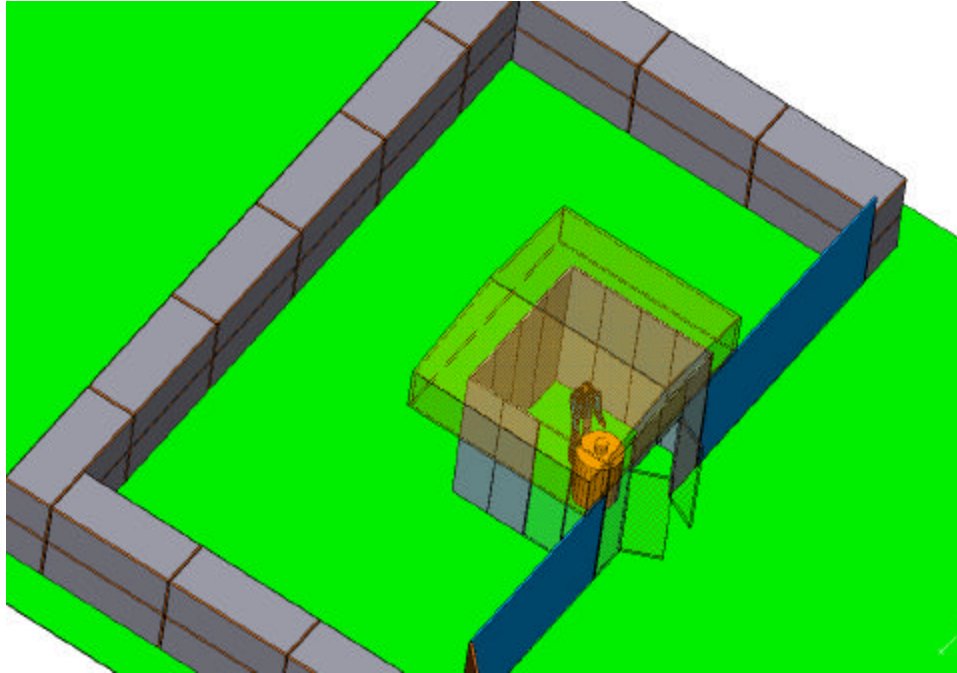


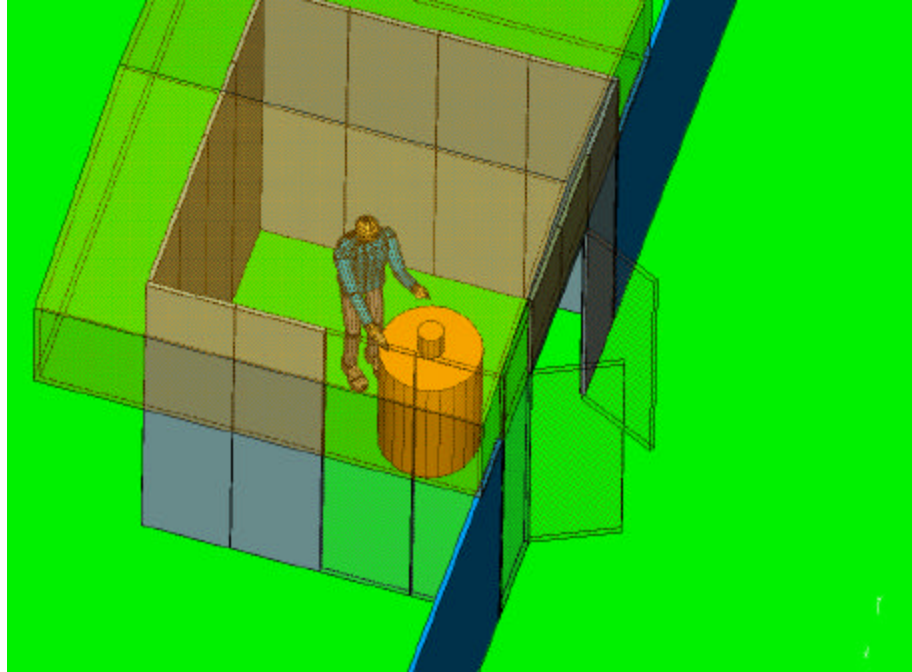


## Herculite Room at Fermilab's Lab 3

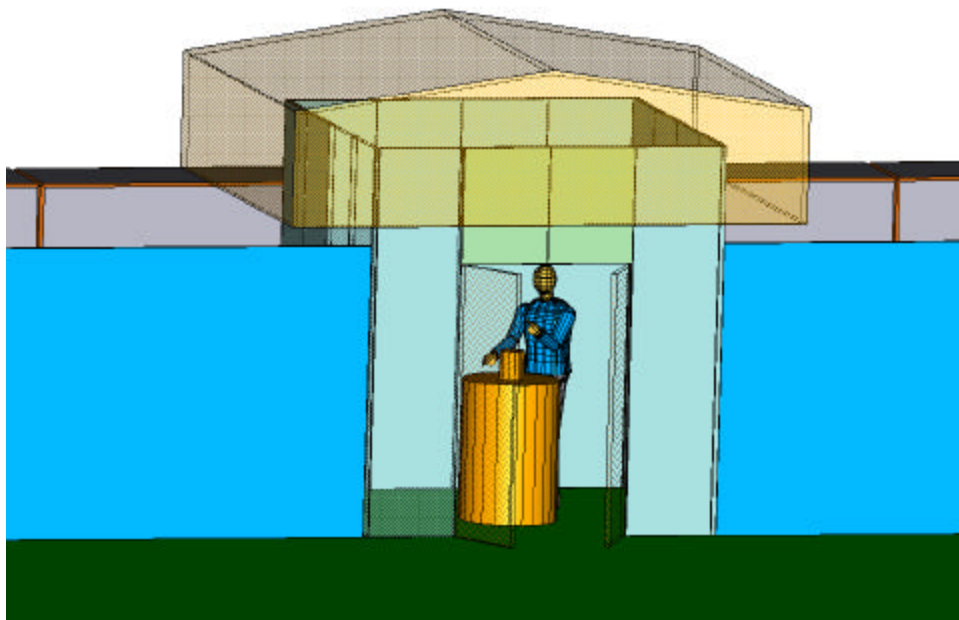












## Mobile Carts for Power, DAQ, and Vacuum Pumping





## Costs for Setup

- Herculite and unistrut structure \$5K
- Cryogenic transfer piping \$3K
- Hydrogen Manifold for Gas \$3K
- Miscellaneous Cryogenic Instrumentation \$10K
- ODH, Flammable Gas install \$5K
- Piping for venting hydrogen and helium \$2K
- Riggers to Move future MTA helium Tank \$2K

**Approx Total \$30K**

## Contingencies

- Riggers for blocks \$5K
- Electricians for 1 week \$5K
- FESS \$5K

**CONTINGENCY \$ 15K**